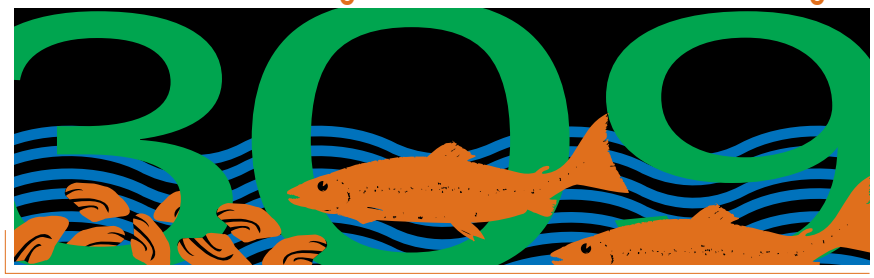
state enhancement grant assessments and strategies




# AQUACULTURE

**NOAA** / **NOS** / Office of Ocean and Coastal Resource Management

*Coastal Programs Division*

October 1999

NOS/OCRM/CPD 99-11

# *Overview*

*This report describes the changes to state, territory and commonwealth coastal zone management (CZM) programs to improve the protection of aquaculture resources that were completed or initiated during the time frame of the latest 309 Assessments and Strategies, under which Aquaculture is the newest enhancement area. These changes were characterized by the States in the last round of Assessments, which were submitted to OCRM in February of 1997. If Strategies were developed to protect aquaculture resources, the planned activities are also summarized.*

*While a new enhancement area designated for Section 309 funding, improving the protection of aquaculture resources and consideration of the demands on affected areas has been a fundamental goal of the Coastal Zone Management Act (CZMA) since its passage in 1972. Primary objectives include ensuring that essential habitat for living resources and sensitive areas such as coral reefs, are protected through appropriate management regimes (i.e, regional or site-specific); and understanding and balancing the often competing uses in the exclusive economic zone and Outer Continental Shelf, such as demands for food, energy, minerals, National defense needs, recreation, transportation, and waste disposal.*

*The National Coastal Zone Management Program (CZMP) is a voluntary partnership between the Federal government and the 35 U.S. coastal states, territories, and commonwealths authorized by the CZMA to:*

> *- Preserve, protect, develop, and where possible, restore and enhance the resources of the Nation's coastal zone for this and succeeding generations;*
>
> *- Encourage and assist the States to exercise effectively their responsibilities in the coastal zone to achieve wise use of land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development;*
>
> *- Encourage the preparation of special area management plans to provide increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas and improved predictability in governmental decision-making; and*
>
> *- Encourage the participation, cooperation, and coordination of the public, Federal, State, local, interstate and regional agencies, and governments affecting the coastal zone.*

*In the 1990 reauthorization of the CZMA, Section 309 was amended to create the Coastal Zone Enhancement Program. Its intent was to provide incentives to States to make improvements to their coastal programs in any of eight areas of national significance (a ninth was added in 1996), including ocean resources. As a part of the Section 309 grant process, periodically all the coastal programs must develop Assessments — a critical examination of each of the nine enhancement areas. The Assessments provide a comprehensive review of activities previously performed by the CZM program (with particular emphasis on 309-funded efforts), identify specific impediments or needs, and present a general characterization of the adequacy of the State=s management framework for that area. The Assessments conclude with a ranking of the area as high, medium, or low, based on its importance in the State; the need to improve the State=s ability to manage the area, and the suitability of using the Section 309 program as the means to address it. For those issues ranked as a high priority for Section 309 purposes, States develop multi-year Strategies, laying out a framework for activity and funding levels which, at the project=s conclusion, should lead the State to specific program changes that also are defined.*

*Improvements to state coastal programs are generally intended to encompass new or strengthened laws, regulations, or other enforceable policies at the state and local level. Examples of allowable activities included: developing or revising state or local statutes, regulations, and ordinances related to ocean resources (e.g., regulations for fisheries, aquaculture, ocean mining); developing or improving state processes and improving coordination among agencies responsible for managing ocean resources, such as developing memoranda of understanding, and geographical information systems to improve decision-making in conflict areas; and*

*Because Aquaculture is a relatively new enhancement area for 309, the activities that states have completed or planned to complete are still small in number. The first section of this report contains state-specific summaries, organized by Region. The summaries generally describe the environment for aquacultur eresources and planning; identify obstacles to addressing aquaculture resources and the need for specific refinements to improve the environment for planning; and if applicable, detail the State-s strategy for achieving those improvements (or other planned activities). A State contact is included for the purposes of obtaining additional information.*

*The second briefer section pertains to obstacles and needs.*

*The report concludes with a table, which provides a snapshot of the overall distribution of aquaculture projects by State and priority level, to provide a better understanding of how states are currently prioritizing their Aquaculture activities.*

***Kristine Schlotzhauer** of NOAA-s National Ocean Service compiled the information found in this report. For further information or additional copies of this report, please contact Kristine at (301) 713-3113 x203 or kristine.schlotzhauer@noaa.gov.*

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# State Summaries

# Northeast

# Connecticut

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Connecticut is the nation=s second largest shellfish producer, generating an estimated 56 million dollars in dockside revenue in 1992. The industry has grown from one million pounds of shellfish per year in 1985 to 8.2 million pounds per year in the period from 1991-1993. This increase has been attributed to an industry/state partnership to restore historic oyster beds, and is also the result of improved water quality and aquaculture practices.*

## Obstacles/Needs

**More usable information**: If shellfish leasing and aquaculture resource information were available in GIS format, the state feels it could readily integrate aquaculture considerations into existing regulatory analyses, as well as planning and resource analysis, and could begin to develop a coordinated statewide aquaculture policy. The interagency councill charged with aquaculture planning is by statute limited to addressing land based systems. There is no coordinated statewide mechanism to develop policies addressing water based issues.

**Coordination:** The development of general permits specific to aquaculture activities that would allow for better coordination among licensed aquaculturalists, and municipal shellfish and harbor management commissions.

**GIS Accessibility:** Increased availability of GIS accessible information on aquaculture will help to ensure an interdisciplinary community approach to the potential uses of aquaculture.

## *Summary of Strategy*

*The state will develop a general permit to authorize some water shellfishing activities which have minimal impact on navigation and coastal resources, coordinating the promotion of aquaculture, a water dependent use, with other regulated activities. For more involved aquaculture activities, the state will develop a managememt plan based on GIS information.*

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# Delaware

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*The Delaware Aquaculture Act was passed by the 135th General Assembly in June 1990 and signed by Governor Castle the following month. This Act designateds aquaculture as an agricultural activity and designated the Department of Agriculture as the lead agency for the coordination of such related activities in the state. The legislation also created an aquaculture task force, tasked with reporting the status of aquaculture and providing important background information on the industry. The University of Delaware Sea Grant Advisory Service conducts educational programs and applied research in aquaculture and has developed an information resource center consisting of technical reports and manuals, extension fact sheets, and videos. Currently the industry is very small and those that are involved focus mostly on freshwater ponds and tank culture.*

## Obstacles/Needs

*None identified*

## *Summary of Strategy*

*None*

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# Maine

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: High

## *Issue Characterization*

*Aquaculture is a thriving industry in Maine that has grown significantly in the last fifteen years and is occurring in several places along the coast. From an almost nonexistent industry in the 1980's, the farm-gate value of aquaculture products is now close to $45 million annually in five major sectors: salmon, trout, mussels, oysters, and nori.*

## Obstacles/Needs

*Some gaps in addressing aquaculture include inefficiencies in the regulation of aquaculture and the creation of new aquaculture businesses in Maine.*

**Complexity of lease obtainment:** The length of time required to obtain a lease, complexity of the lease application process, the need for streamlined lease procedures and the need to increase the amount of acres a company can lease are all specifi concerns that currently hinder the development of the aquaculture industry within the state.

**Lack of Information:** Information about appropriate and inappropriate places for siting aquaculture is lacking. Potential areas of conflict will need to be noted in advance so that they can be avoided during the planning process.

**User Conflicts:** As the industry grows and demands more access to acreage, Maine is likely to experience more marine use conflicts, and therefore the state will need more guidance and tools, such as a map of existing uses, to manage these conflicts.

## *Summary of Strategy*

*Strategic Plan for Aquaculture:* The Maine Coastal Program will assist the Department of Marine Resources in carrying out Maine=s Strategic Plan for Aquaculture. The Strategic Plan calls for the creation of two new positions at the Department of Marine Resources in aquaculture; one a fish pathologist, the other an aquaculture ombudsmen. If these positions are approved by the state legislature, the Coastal Program will dedicate resources to specific program changes in the Strategic Plan. If not, the Coastal Program will assist with policy development tasks to improve the consistency, efficiency and responsiveness of the state in both promoting and regulating aquaculture as outlined in Maine=s Strategic Plan for Aquaculture.

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# Maryland

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*A state aquaculture program was initiated in 1990 to encourage the orderly development of the aquaculture industry while ensuring that aquaculture operations do not adversely impact the wild stocks of fin fish and shellfish. Presently there are 203 aquaculture permits issued for tidal and nontidal finfish aquaculture enterprises. There are also provisons for tidal water aquaculture experimental net pens. There are approximately 830 oyster leases for 7882 acres of tidal bay bottom utilized for private oyster aquaculture.*

## Obstacles/Needs

**Funding Constraints:** An Oyster Roundtable was formed in 1993, but the action items that were decided upon by the group were delayed or only partially implemented due to funding constraints**.**

**Impact of Non Native Species:** Some concerns about impact of introducing non-native species on native species exist.

## *Summary of Strategy*

*There are several strategic programs in place that the state feels will be a good opportunity to develop Aquaculture Plans. These include the state oyster repletion program and the Chesapeake Bay Program=s Aquatic Reef Habitat program. These programs provide the opportunity to implement a more comprehensive oyster restoration effort. Actions that need to be taken by the State Fisheries Service and its partners to complete implementation of the Oyster Recovery Action Plan need to be determined.*

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# Massachusetts

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*With the development of the Massachusetts coastline and the many competing uses for limited space, the rising development of aquaculture has resulted in numerous siting frustrations for prospective culturalists. There is no efficient methodology for applicants to determine what sites are acceptable for aquaculture uses, nor does there exist any central entity which has access to information on the range of activities and site uses along the Massachusetts coastline. In order to make the necessary changes for this enhancement area, it is necessary to develop a proactive aquaculture planning and siting process for state waters. By transitioning from a reactive process to a proactive statewide approach to planning, aquaculture siting can be made much more efficient and environmentally responsive.*

## Obstacles/Needs

Siting Problems: Currently no central entity has access to the range of activities and uses of different sites along the Massachusetts coast, thus rendering the siting process a long and inefficient process. Through implementation of the proposed Aquaculture Strategic Plan, the hope is that many of these siting problems will be reduced.

## *Summary of Strategy*

***Aquaculture Strategic Plan***: A proposed Aquaculture Strategic Plan is being developed to help streamline the process of approving site leases, as well as to provide a more central access point to information about aquaculture issues.

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# New Hampshire

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*Marine aquaculture is a new and expanding industry in New Hampshire. Currently there are only a few commercial aquaculture operations in the state, however there are several proposed operations and increasing interest, particularly from the commercial fishing industry. Additionally, scientists at the University of New Hampshire are conducting significant research on the biological and engineering aspects of marine finfish and shellfish culture.*

## Obstacles/Needs

**Deficit in aquaculture planning**

**Knowledge of the science of aquaculture**

**Coordination and communication**: This area needs to be improved and several conflicts between commercial and recreational shellfishing need to be addressed.

## *Summary of Strategy*

***New Hampshire Aquaculture Management Plan:*** In the development of the first New Hampshire Aquaculture Management Plan, several tasks, including research and policy analysis as well as permit streamlining activities, will be performed. The key components of this planning process will be detailed habitat mapping and evaluation, as well as stakeholder participation. The University of New Hampshire and its partners will develop an Open Ocean Aquaculture project. The experience of the project will help to provide additional information for the management plan.

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# New Jersey
## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*The state=s aquaculture activities within the coastal zone involve the production of hard clams and American oysters. There are currently about eight hard clam hatcheries along the coast in Ocean and Atlantic counties which produce Aseed@ for subsequent rearing to market size on parcels of bay bottom leased from the State. Oyster culture occurs predominantly within the Delaware Bay, although smaller operations occur on the Atlantic coast as well. Future aquaculture operations may include the culture of additional species of shellfish and finfish, including bay scallops, blue mussels, crustaceans, hybrids striped bass and other species.*

## Obstacles/Needs

*None identified*

## *Summary of Strategy*

***Adoption of Management Plan:*** Existing regulations, state and local statutes, guidelines and adoption of the Aquaculture Management Plan meet the programmatic objectives of this enhancement area. Continued coordination among the New Jersey Coastal Management Program; Fish, Game and Wildlife Program, water quality agencies and aquaculture agencies; task force and industry representatives should continue in order to improve program policies and standards as aquaculture activities develop in the state.

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# New York
## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Marine finfish aquaculture in New York State is limited to the planning stages. The Department of Environmental Conservation recently assumed lead agency status in the review of project proposals related to aquaculture activities. There have been private and university interest in various aquaculture operations, but to date no commercial viable operations exist. Freshwater aquaculture exists in New York, but most activities occur outside of the coastal zone.*

## Obstacles/Needs

**Water Quality:** Water quality concerns of aquaculture focus on nutrient input as well as the potential for increasing the frequency or severity of pathogenic diseases.

## *Summary of Strategy*

*None developed*

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# Rhode Island

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*There are approximately 65,000 acres of tidal waters in Rhode Island located within Narragansett Bay and approximately 5000 acres in the coastal salt ponds along the south shore. Presently existing Coastal Resource Management Council (CRMC) approved aquaculture operations lease a combined total of 8.66 acres in Rhode Island=s tidal waters, all of which are located in the salt ponds. Comparatively, oyster leases at the turn of the century were utilizing approximately 21,000 acres in Narrangansett Bay. Today there are no aquaculture leases in the Bay. All of the permitted aquaculture operations are growing molluscan shellfish, primarily oysters, followed by hardshell clams, and pond scallops. Aquaculturalists utilize traditional bottom growing culture techniques or more recent technologies consisting of cage and rack designs for grow out.*

## Obstacles/Needs

**Nonexistence of an aquaculture management plan for tidal waters:** The CRMC needs to first identify the major user group activities within tidal waters such as established commercial fishing grounds, municipal mooring fields, etc. This would be followed by identifying suitable areas for aquaculture operations that support sufficient growth rates and water depths. The Council could then delineate the existing natural resources in those areas and the uses of those resources. By utilizing GIS software and overlaying those data sets, the Council can conduct use constraint analyses of the sites and properly address resource and user group concerns.

## *Summary of Strategy*

***Development of a state wide plan:*** The state is in the process of putting together a plan for the management and siting of public and private marine aquaculture facilities within tidal waters. The Rhode Island Legislature has delegated the Coastal Resources Management Council as the lead permitting agency for aquaculture operations within the state. In order to meet this mandate, the CRMC strategy proposes the development of a statewide management plan using GIS as the primary tool in a site suitability analysis. The CRMC is building its existing GIS database on mooring fields, fixed structures, public access points, swimming areas, marinas, boatyards, etc, through the use of a GPS receiver. Existing databases from other sources will also be incorporated into a site suitability analysis. Maps depicting potential aquaculture sites will be developed as the basis of a statewide aquaculture management plan.

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# Virginia

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: High

## *Issue Characterization*

*Marine aquaculture represents Virginia=a fastest growing industry and 85 percent of the total revenues of the aquaculture industry. The majority of marine aquaculture conducted in Virginia consists of oysters and clams. Marine aquaculture typically involves the use of state owned submerged lands or the waters overlying the public bottom. More recently, there has been increased interest in expanding shellfish aquaculture activities into the water column through the use of floats, racks, and trays. With most of the world=s major fisheries in decline, aquaculture will be increasingly relied upon to provide an important source for a growing global human population.*

## Obstacles/Needs

**Difficulty in Regulation:** Because aquaculture is a relatively new industry in Virginia=s marine waters, it does not fit perfectly into various laws, regulations, and common practices which have developed over time to manage more traditional uses of public waters.

## *Summary of Strategy*

***1992 VA Aquaculture Development Act***: Several actions are pending based upon this legislation. House Document 15-establishes and gives authority to the Virginia Marine Resources Council for the regulation and leasing of aquaculture sites. As part of House Joint Resolution #535, the Chesapeake Bay Commission has been asked to study the shellfish industry, and in House Joint Resolution 449, the Virginia Marine Resources Council has been tasked with identifying those statutes that may inhibit the development and operation of aqauculture facilities

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# Southern/ Caribbean

# Alabama

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*The Alabama Department of Conservation and Natural Resources (DCNR), Marine Resources Division, and Auburn University Marine Extension and Research Center (AUMERC) are participating in various mariculture activities in the Alabama coastal area. These include the CASH program, which involved the Claude Petite Mariculture Center=s successful production of red snapper from larval stages to a feeding population, production of red fish, striped bass and trout for release in state waters, and oyster farming.*

## Obstacles/Needs

**Additional Information:** Because this is a new growth industry with great potential to provide a food source for the future, research studies are important in order to develop knowledge that will aid in the creation of a sustainable industry for coastal Alabama.

**User Conflicts:** Without a sound management plan, it is reasonable to expect that conflicts between recreational and commercial users of state waters will escalate. Crab traps in the channels already irritate recreational boaters.

**Water Quality**

**Threats of incompatible species and viruses**

## *Summary of Strategy*

*Due to the economic potential of mariculture and the cultural/societal implications for traditional fisheries, serious consideration should be given to investigating the technical, physical, market, and manpower needs for a business enterprise of this nature to succeed.*

*Creation of a Asustainable@ industry:* The state would like to develop knowledge with the help of the AUMERC and DNRC to gather information for the development of a comprehensive management plan for aquaculture.

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# Florida

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## Issue Characterization

*Aquaculture can be divided into two major categories-freshwater aquaculture and marine aquaculture. The vast majority of Florida aquaculture is freshwater, involves mostly ornamental production, and occurs in upland pond and tank systems. The ornamental segment of the industry, including freshwater and tropical aquarium species, comprised over two thirds of the State=s total production in 1995, which was valued at over $79 million. Marine aquaculture activities in the state consist almost exclusively of clam and oyster culture, accounting for roughly 8% of total state aquaculture production. Currently there are no marine finfish being raised commercially in coastal waters. The Department of Environmental Protection (DEP) , however, is studying the logistics of permitting such activities and expects to develop a regulatory regime to address the matter by approximately 1998. Presently there is at least one pilot project dealing with the culture of redfish in marina net pens that DEP is using to help devise such a permitting program. In the next year or so, DEP will likely consider the designation of marinas or other non-recreational areas for finfish culture activities in coastal waters. It is more likely that future marine finfish culture in Florida will involve hatcheries and be geared toward the replenishment of wild stocks.*

## Obstacles/Needs

**Lack of available insurance for aquaculture crops:** The USDA is now examining the various aquaculture industries nationwide in an effort to determine whether existing crop insurance programs can be applied to aquaculture or whether new ones can be developed.

**Research and Development Gaps:** The second gap identified by the officials concerns the fact that gains in research and development are slow and mostly privately funded. Research aimed at developing better physical systems such as tank systems or advanced net pen design could help by allowing culture to take place in areas previously off limits to aquaculture. By eliminating or mitigating the effects of net pen effluent for example, better physical facilities might relieve some of the burden to site an operation in a particular area in an effort to avoid use conflicts.

## *Summary of Strategy*

***Study of Current Legislation***: The state has identified the need to take time to examine the effects of the current aquaculture legislation on the industry, and to determine what major gaps remain. By that time, it is more likely that the appropriate projects for funding with this 309 enhancement area will have been identified and a proper management plan can be formed based on such information.

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# Louisiana

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Aquaculture is an important element in the Louisiana economy and one that promises growth, but not necessarily in all parishes. For example, in 1995, the gross value of aquaculture in Louisiana was $155 million. For the 19 parishes comprising the coastal zone, the 1995 value for aquaculture activities was $56.7 million. Oysters are by far the most important aquaculture in Louisiana, having a value of $24.5 million in 1995, or 43% of the total. Crawfish production fluctuates from year to year. The extremes may be exaggerated as a result of the importation of peeled crawfish tails from China.*

## Obstacles/Needs

None

## *Summary of Strategy*

*None included with Assessment*

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# Mississippi

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*The State of Mississippi has been a pioneer in aquaculture activities. The pond raised catfish industry has been in existence for approximately 25 years and is primarily located in the Mississippi Delta. The demand for aquaculture products is growing stronger as the capture fishery supply continues to fall short of meeting market demand for seafood. There are currently about 25 small scale privately held aquaculture operations in Mississippi. Educational opportunities are offered through the West Harrison County Community Training Center and the Hancock County Vocational Training Center, and technical assistance to aquaculturists is available through the Department of Marine Resources.*

## Obstacles/Needs

**Funding Constraints:** The limited availability of conventional financing for aquaculture business ventures is perceived to be an impediment to the success of the industry.

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## *Summary of Strategy*

*None*

# North Carolina

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*No Information Provided with Assessment.*

## Obstacles/Needs

**Point and nonpoint source pollution from shellfish beds and hatcheries**

**Loss of wetlands**

**Public acess issues**

**Uncontrolled development resulting in major or irreversible damage**

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## *Summary of Strategy*

*None*

# Puerto Rico

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*While nominally lodged within the Fisheries Division of the Department of Agriculture, publicly supported aquaculture activities are relatively low key. The two major aquaculture enterprises that are currently operatingin Puerto Rico are entirely privately financed and managed.*

## Obstacles/Needs

None

## *Summary of Strategy*

*None*

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# South Carolina

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Aquaculture is a new enhancement area for 309, but is an activity of long history in South Carolina. Beginning in at least the last century, holders of oyster leases have planted and managed these areas to improve production. This effort consisted primarily of planting shell to increase oyster spat settlement. In more recent years, the South Carolina Department of Natural Resources has begun to study and encourage other types of aquaculture. In the coastal zone, the two types of new activities receiving the most study are the production of shrimp, both native and non-native, and the production of clams in intertidal areas. The increase of both of these types of aquaculture in the coastal zone has resulted in heightened awareness by the public and resource agencies of the potential of disruption of traditional uses of the resource, changes in the aesthetics of the landscape, as well as potential environmental impacts.*

## Obstacles/Needs

**Lack of Methodology for Assessing Impacts:** The major impediment to managing the permitting of aquaculture activity is a methodology for assessing cumulative impacts of aesthetic issues and siting containment structures, floats, and other necessary apparatus in pristine areas is a growing concern and one where no current standards exist. Something other than a simple case by case method of permitting is needed. Because of the large role that local government has with their local zoning authority, they are a necessary player in the permitting and planning process.

## *Summary of Strategy*

***Pilot Study:*** The state of South Carolina is looking to develop a pilot study that would address the best methodologies for assessing cumulative impacts and establishing siting criteria. The pilot study may identify areas in which existing authorities would need to be changed. The state could possibly incorporate aquaculture as an element in the Cumulative and Secondary Impacts SAMP.

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# United States Virgin Islands
## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Presently there is only one commercial aquaculture operation in the Virgin Islands. This involves thirty acres of land which was leased from the Government for the construction of six units for the production of tilapia. A considerable amount of aquaculture/mariculture research is being carried out by the University of the Virgin Islands Research Center to look at alternative operations*.

## Obstacles/Needs

**Lack of Information:** The territory will need to conduct research and collect data before any regulations can be drafted.


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## *Summary of Strategy*

*None*

# Pacific

# Alaska

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*Alaska=s current aquatic farm program began in 1988 when the state legislature passed Chapter 145, SLA 1988. Ocean farming of finfish for profit was prohibited by statute in 1990. The statute then shifted to the shellfish farming industry. Alaska=s aquatic farm program focuses on shellfish farming and aquatic plants. Currently, Alaska has 54 farms under a comprehensive permit system and two aquatic farm leases. Most of the farms produce primarily Pacific oysters and mussels. Several experimental species such as scallops and kelp are being grown. One shellfish hatchery in the state produces oyster and littleneck clam seed. The state anticipates completion of a mariculture technical center/shellfish hatchery within the next year. After that, seed production of other species may take place.*

## Obstacles/Needs

**Water Quality and Certification of Professionals:** Alaska Department of Environmental Conservation (DEC) water quality certification is an area of concern due to the fact that upland uses or activities may be precluded or restricted once DEC certifies an area where the product is grown. There is also increased costs for DEC representatives to complete the certification process necessary prior to the sale of any farmed product. The process involves not only a week of water samples, but the transport of samples by air to the DEC lab for PSP (paralyctic shellfish poisoning) tests, before any product can be sold. Farmers would would like to see another lab brought to Southeast Alaska, as there is currently only one DEC lab in Palmer which serves the entire state, which may become more of a problem in the future.

## *Summary of Strategy*

*None*

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# American Samoa

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Aquaculture in American Samoa is primarily limited to some giant clam-raising on reefs. As such, there is no aquaculture industry and no required changes in policy or statute. Currently, there are no plans to expand the aquaculture industry. Recently, under the auspices of the Department of Marine and Wildlife Resources, a small project involving the raising of tilapia in Nu=uuli was started. Tilapia species are extremely invasive and could be a threat to native species.*

## Obstacles/Needs

**Lack of Regulation**

**Limited Space:** There is a limited amount of lagoon areas suitable for aquaculture.

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## *Summary of Strategy*

*Due to the small scale of the aquaculture industry in American Samoa, there is no strategy in place.*

# California

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*California state laws define aquaculture as a type of farming involving the propagation, cultivation, maintenance, and harvesting of aquatic plants and animals for human consumption or bait. Under this definition, aquaculture does not include the propagation, cultivation, or maintenance of aquatic plants or animals for the purpose of habitat restoration or enhancement (e.g., salmon hatcheries constructed as mitigation for water diversion projects.)*

*The majority of California=s aquaculture development is comprised of commercial farming of freshwater fish, and is sited outside the coastal zone. Within the coastal zone, the major aquaculture activities include the commercial farming of oysters, abalone, and mussels. To a lesser degree, clams and scallops are farmed. These activities involve onshore and offshore components .*

## Obstacles/Needs

*None Identified*

## *Summary of Strategy*

*None*

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# Commonwealth of Northern Mariana Islands
## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*The CNMI has a very small scale aquaculture industry. There are believed to be less than five commercial ventures all of which are operated by individuals. The facilities are essentially water tanks having minimal effluent discharge. During the past year the CNMI Land Grant program through the Northern Marianas College (NMC) has begun an aquaculture program focusing on small scale demonstration projects.*

## Obstacles/Needs

**Submerged Lands Leases:** A primary difficulty in the establishment of mariculture is the need for submerged lands leases. This is an expensive and time consuming impediment. Conceivably an effort could be made to designate a suitable area for mariculture demonstration (e.g. sea grasses, sponge, oyster) and assist with obtaining necessary submerged lands authorizations.

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## *Summary of Strategy*

Coastal Resources Management (CRM) should consider providing staff support to NMC Land Grant aquaculture development efforts to facilitate industry development consistent with CRM policies

# Guam

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*No characterization was provided with Assessment*

## Obstacles/Needs

None Identified

## *Summary of Strategy*

None Identified

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# Hawaii

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*Hawaii has the oldest tradition of aquaculture fishponds in the United States. Modern aquaculture began in the late 1960's to the early 1970's, and since that time aquaculture has grown to be a significant part of the state=s economy. Production has increased from 178,000 pounds valued at $525,000 in 1978 to 1.5 million pounds valued at $13 million in 1995. It is estimated based upon catch and consumption statistics, that the state=s aquafarms produce between two and three percent of all seafood consumed in Hawaii. The state=s economy is changing and struggling due to lack of diversity, limited resources, and limited options for export industries. Rural, agriculture-based economies are experiencing high unemployment and economic hardship, therefore Hawaii needs industries that economically address resource availability, environmental sustainability, and community support. Aquaculture development fulfills those needs in that it complements tourism in the areas of food production, open space, ocean habitat management, as well as techno-tourism.*

## Obstacles/Needs

**Need for aquaculture siting studies:** Realization of new and emerging opportunities in aquaculture will require access to coastal waters Facilitating environmentally compatible access by commercial projects could be assisted by identifying regulatory streamlining opportunities and establishing new procedures where appropriate. Siting studies were conducted at inland areas to identify sites suitable for aquaculture facilities. Similar studies should also be undertaken with respect to identifying environmentally appropriate coastal and marine aquaculture sites.

**Limited access to available data:** State efforts in 1978 mapped suitable areas for aquaculture development based primarily upon slope and soil type. These maps were converted to a GIS system maintained by the Office of Planning. Managing coastal expansion of aquaculture could be greatly facilitated if prospective farmers had access to GIS information that included natural resources, environmental, infrastructure, regulatory, community, and existing use data.

**Water quality conflicts:** Studies are needed to identify both technological means and location alternatives so that aquaculture operations can be sited and developed in compliance with state water quality standards.

**Multiple use conflicts**

**Ceded land issues**

**Traditional gathering rights of native hawaiians**

## *Summary of Strategy*

Aquaculture has cultural and historical significance and extensive economic potential to help diversify the economy of Hawaii. The state currently has a designated lead agency and an aquaculture development program. Although there are areas that could be strengthened and issues that could be resolved, the current state efforts are addressing the major issues. Furthermore the Ocean Resources Management Plan (ORMP) recommends several measures that directly address the gaps noted in this aquaculture area. ORMP implementation is designated as a medium priority in this assessment. Some recent government reorganization proposals have suggested dismantling Hawaii=s aquaculture program. If this happens, the relative priority of this enhancement area for the Section 309 program should be reevaluated.

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# Oregon

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Commercial aquaculture in Oregon primarily involves oysters. Between 1993 and 1995, oyster spat production increased substantially in quantity while the amount of acreage remained virtually the same at about 3,500 acres. Most of this production occurs in Tillamook Bay, with the remainder in Coos Bay, Netarts Bay, and Yaquina Bay. There is also a very minimal amount of commercial clam culturing, such as at the mouth of the Umpqua River. Public aquaculture operations largely consist of salmon and trout hatcheries run or funded by the State Department of Fish and Wildlife. Ten of the thirty-four state run fish hatcheries are in the coastal zone. Statewide, these hatcheries release about 90 million fish annually, over half of which are salmon and the remainder trout and steelhead.*

## Obstacles/Needs

*None identified*

## *Summary of Strategy*

*None*

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# Washington

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Medium

## *Issue Characterization*

*Washington=s aquaculture industry is dominated by salmon net pen facilities in Puget Sound; oyster growing in Puget Sound, Grays Harbor, and Willapa Bay; and mussel growing in Puget Sound. Ship based deep water harvest of geoduck clams in Puget Sound is included here even though it is the harvest of a wild crop because many of the management issues are similar to those in aquaculture*

## Obstacles/Needs

**No contemporary, comprehensive information available**: The most recent comprehensive review of the Washington State aquaculture industry was published in 1987, and is now out of date.

**Water quality:** Declining water quality is adversely affecting commercial shellfish beds

**Spartina invasions**

**Land use conflicts**: residential and aquaculture land uses.are often in conflict with each other

## *Summary of Strategy*

*None*

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# Great Lakes

# Michigan

## 309 Aquaculture Grant Enhancement Summary

1997 Assessment: Low

## *Issue Characterization*

*The Department of Natural Resources operates six fish hatcheries across the state for the propagation and enhancement of wild fish populations. Aquaculture as a private industry in Michigan is currently limited. Michigan aquaculture facilities are mostly small part-time businesses, producing game fish, food fish, and providing fee-fishing. Rainbow, brook and brown trout, largemouth bass and bluegills are the most commonly grown species, and are primarily reared in ponds. In recent years, most new aquaculture businesses are for production of food fish. In 1992, total trout sales in Michigan were valued at $2.5 million, ranking sixth in the nation. Industry representatives estimate the total value of 1992 aquaculture production in Michigan, including trout, at $4.5 million*.

## Obstacles/Needs

*There are currently no gaps or obstacles in addressing aquaculture objectives in Michigan.*

## *Summary of Strategy*

Aquaculture is not expected to be a major industry in Michigan=s coastal zone. The Michigan Aquaculture Development Act addresses concerns expressed by the Department of Natural Resources. The Department of Agriculture has recently hired an aquaculture specialist to administer the program, and will coordinate the program closely with the Department of Natural Resources in implementation of the regulatory program. The priority ranking could change over the next few years if aquaculture development expands in Michigan.

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# Pennsylvania

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*The Commonwealth of Pennsylvania is in the process of passing Senate Bill 1638, recognizing the aquaculture industry as an agricultural activity. This bill is designed to ease regulatory burdens by designating the Department of Agriculture (DOA) as the authority over commercial aquaculture operations. As part of the act, the DOA shall develop a plan to promote and develop the aquaculture industry, with economic development and the exportation of products being major components of the plan. The act will also create a twelve member advisory committee to develop the plan. A fund, known as the Aquaculture Development Fund, will also be established to stimulate the growth of aquaculture in the Commonwealth.*

## Obstacles/Needs

*None identified*

## *Summary of Strategy*

*None*

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# Wisconsin

## 309 Aquaculture Enhancement Grant Summary

1997 Assessment: Low

## *Issue Characterization*

*Aquaculture in Wisconsin consists primarily of fish hatcheries, with about 2,250 private hatcheries in the state, two federal hatcheries, and 14 state run hatcheries. Five of the state hatcheries are located within the coastal zone, and eleven of fourteen hatcheries provide fish for stocking the Great Lakes. Sport fishing in the state is largely supported by these stocking programs.*

## Obstacles/Needs

**Impacts on Coastal Resources:** Hatcheries have increased nutrient loading to streams from hatchery wastewater as well as from the introduction of diseases to native fish stocks.

**Licensing:** All hatcheries must be licensed by the Wisconsin Department of Natural Resources; therefore the DNR needs to complete workshops for applicants to facilitate the licensing process and enhance compliance with state law.

## *Summary of Strategy*

*None*

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# Obstacles/ Needs

# Obstacles/Needs

**AL** *None Identified*

**AK** Alaska Department of Environmental Conservation water quality certification is an area of concern due to the fact that upland uses or activities may be precluded or restricted once DEC certifies an area where the product is grown.

**AS** There is a limited amount of lagoon areas suitable for aquaculture.

**CA** There is a need to improve existing regulations as well as the process for phased review as well as improved coordination mechanisms. The program needs to improve its work with OCRM and other federal agencies.

**CNMI** Obtaining submerged lands leases is a very time consuming impediment.

**CT** The state needs more usable information in GIS format in order to facilitate planning and resource analysis as well as coordination efforts.

**DE** *None Identified*

**FL** There is no insurance available for aquaculture crops. Research and development efforts are currently slow and privately funded. The state would like to aim research specifically at programmatic objectives.

**GU** *None Identified*

**HI** There is a need for aquaculture siting studies to identify appropriate coastal and marine aquaculture sites. There is also a lack of access to available data to help facilitate aquaculture development and aid in planning.

**LA** *None identified*

**ME** The state will need to obtain more access to information and aquaculture resources as the industry develops.

**MD** *None Identified*

**MA** Because there is no central entity with access to the range of aquaculture activities along the coast, the siting process is a long and inefficient one.

**MI** *None Identified*

**MS** *None Identified*

**NH** Coordination and communication needs to be improved, as well as aquaculture knowledge and planning.

**NJ** *None Identified*

**NY** Water Quality Concerns of aquaculture are focused on nutrient input as well as the potential for the severity of pathogenic diseases.

**NC** *None Identified*

**OR** *None Identified*

**PA** *None Identified*

**RI** There is currently not an aquaculture management plan for tidal waters in place.

**PR** *None Identified*

**SC** The biggest obstacle currently faced is the lack of methodology for assessing cumulative impacts of the aesthetic issue of siting contaminent structures,

floats, and other apparatus in pristine areas.

**USVI** The territory will need to conduct research and collect data before any regulations can be drafted.

**VA** *None Identified*

**WA** The most recent infomation regarding aquaculture was published in 1987 and therefore is now out of data. The state is also dealing with land use conflicts.

**WI** The Department of Natural Resources is responsible for the licensing of all hatcheries and therefore needs to complete workshops for applicants in order to facilitate the licensing process. Nutrient loading has also been a problem.

# Appendix

U.S. Department of Commerce
National Oceanic and Atmospheric Administration • National Ocean Service